Claims:

1. A laminated piezoelectric device obtained by alternately laminating piezoelectric layers containing Pb and conducting layers containing palladium as a conducting component, wherein

the piezoelectric layer formed between the two conducting layers has layer regions where Pb and Pd are mixed together in interfacial portions thereof relative to said conducting layers, said layer regions having a thickness of not larger than 3% of the thickness of said piezoelectric layer.

2. A laminated piezoelectric device according to claim 1, wherein said layer regions have a thickness of 1 to 3% of the thickness of said piezoelectric layer.

3. A laminated piezoelectric device according to claim 1, wherein said piezoelectric layer has a thickness of not smaller than 50 $\mu$m.

4. A laminated piezoelectric device according to claim 1, wherein said piezoelectric layer is formed by a piezoelectric ceramic which has, as a crystal phase, a perovskite composite oxide of an $ABO_3$ composition containing Pb in the A-site and Zr and Ti in the B-site, the element ratio (A/B) of the A-site element and the B-site element in said piezoelectric layer being smaller than 1.

5. A laminated piezoelectric device according to claim 1, wherein said conducting layer has a thickness of not smaller than 1 $\mu$m.

6. A laminated piezoelectric device according to claim 1, wherein said conducting layer contains, as conducting components, an element of the Group VIII of periodic table including at least palladium and an element of the Group Ib of periodic table.

7. A laminated piezoelectric device according to claim 6, wherein when the content of the element of the Group VIII is denoted by M1 mass% and the content of the element of the Group Ib is denoted by M2 mass%, said conducting layer satisfies the following conditions:

$$0.001 \leqq M1 \leqq 15,$$
$$85 \leqq M2 \leqq 99.999,$$
$$M1 + M2 = 100 \text{ mass\%}.$$

8. A laminated piezoelectric device according to claim 6, wherein said conducting layer contains at least one kind of element selected from the group consisting of Ni, Pt, Rh, Ir, Ru and Os as well as palladium as the elements of the Group VIII of periodic table, and at least one kind of Cu, Ag or Au as an element of the Group Ib of periodic table.

9. A laminated piezoelectric device according to claim 1, wherein said piezoelectric layer contains fine voids distributed in an amount of not larger than 15% per the volume of the piezoelectric layer.

10. A laminated piezoelectric device according to claim 9, wherein said voids are distributed in a flat shape with the direction of thickness of the piezoelectric layer as a short axis and the direction of surface of the piezoelectric layer as a long axis.

11. A laminated piezoelectric device according to claim 10, wherein when the length of the short axis of said void is denoted by a and the length of the long axis thereof by b, there hold $b/a \leqq 4$ and $b \geqq 3$ $\mu$m.

12. A method of producing a laminated piezoelectric device comprising the steps of:

forming a conducting paste layer by applying a conducting paste containing palladium as a conducting component onto one surface of a green sheet that is

formed by using a piezoelectric starting powder containing a Pb component;

forming a pole-like laminate by laminating a plurality of pieces of green sheets having said conducting paste layer on the surfaces thereof in a manner that the green sheets and the conducting paste layers are alternately positioned;

forming a pole-like laminated piezoelectric material by firing said pole-like laminate in an atmosphere having an oxygen partial pressure of $10^{-12}$ atm to 0.195 atm; and

forming external electrodes by applying an external electrode paste onto the side surfaces of said pole-like laminated piezoelectric material followed by firing.

13. A method of producing a laminated piezoelectric device according to claim 12, wherein said pole-like laminate is fired at not higher than 1000°C.

14. A method of producing a laminated piezoelectric device according to claim 12, wherein there is used a green sheet formed by blending said piezoelectric starting powder with resin beads.

15. An injection apparatus comprising a container having an injection hole, a laminated piezoelectric device of claim 1 contained in said container, and a valve for injecting a liquid through said injection hole being driven by said laminated piezoelectric device.